FIGURE 1

```
TCTAGACTGG ACAGCATCCA CAAGAGAAGC ACCTAGAAGG AGAATTTTCC CCAGCAGCTT
GCTCAGGACC CTGCAGGAGC CGCAGCTGGG ACTGGACCTG CTGTTAACCA TGAACTCTTC
CTGCTGCCTG TCTTCTGTTT CTCCGATGCT GCCTAACCTC TCTGAGCACC CTGCAGCCCC
TCCTGCCAGC AACCGGAGCG GCAGTGGGTT CTGTGAGCAG GTCTTCATCA AGCCGGAGGT
CTTCCTGGCT CTGGGCATCG TCAGTCTGAT GGAAAACATC CTGGTGATCC TGGCTGTGGT
CAGGAATGGC AACCTGCACT CTCCCATGTA CTTCTTCCTG TGCAGCCTGG CTGCAGCCGA
CATGCTGGTG AGCCTGTCCA ACTCCCTGGA GACCATCATG ATCGCCGTGA TCAACAGCGA
CTCCCTGACC TTGGAGGACC AGTTTATCCA GCACATGGAT AATATCTTCG ACTCTATGAT
TTGCATCTCC CTGGTGGCCT CCATCTGCAA CCTCCTGGCC ATTGCCATCG ACAGGTACGT
CACCATCTTC TATGCCCTTC GGTACCACAG CATCATGACA GTTAGGAAAG CCCTCACCTT
GATCGGGGTC ATCTGGGTCT GCTGCGGCAT CTGCGGCGTG ATGTTCATCA TCTACTCCGA
GAGCAAGATG GTCATCGTGT GTCTCATCAC CATGTTCTTC GCCATGGTGC TCCTCATGGG
CACCCTATAT ATCCACATGT TCCTCTTCGC CAGGCTCCAC GTCCAGCGCA TCGCAGTGCT
GCCCCCTGCT GGCGTGGTGG CCCCACAGCA GCACTCCTGC ATGAAGGGGG CTGTCACCAT
CACTATCCTG CTGGGTGTTT TCATCTTCTG CTGGGCGCCT TTCTTCCTCC ACCTGGTCCT
CATCATCACC TGCCCCACCA ATCCCTACTG CATCTGCTAC ACGGCCCATT TCAACACCTA
CCTGGTTCTC ATCATGTGCA ACTCCGTCAT CGACCCCCTC ATCTACGCCT TCCGCAGCCT
GGAGCTGCGC AACACGTTCA AGGAGATTCT CTGCGGCTGC AACAGCATGA ACTTGGGCTA
GGATGCCCGT GGAGGTGTTC CACATCCAGC CAAGAGACAA AAACAACGCT CAGACGGGAC
GTAAAAGGGT GTTAGGAGCT GGAACTGTGC TTGGCTTCGT CTGTAAGCTC GTGGCCCTTT
GCAGACGGGA CACGGCGTAG GATGGGCTGT CTGTGAGGAT CTGTGTGTGG GTAAGTCAGT
TTGATCTAGC ACATAGCCTG GAAGAATCAG GCAAAGCAGC CCTGAGTGTC ATCTGTGTTC
ATTGCTAGGC ACCCAGGGTT TGTGGCCCCT GCCTGCTTAT TGGCTTTGTA CCAGTAACTG
TGCTTCAAGC CAACCAGACC GGAGGGCTCT CGTGAGCAGA AAGAGTGCTT AGACTTCCGG
CAAGCATCCT GGCTCACAGC GGCCACCTCC TGACCACTAC CGGGAGAGCT TTGCACATAT
TCTGTGGGAG ATTGAGTGAA GCCCTGAAAA CAATGTGATA TTTGCTGCTC CCTTCCAGAA
CTTACATCTG TGCCAGCCTC CCCGAACCCC TGCACAGAGA CATGACCCCC TTCTCCCTGT
GCCGTTGTCA TGGTTGTTAT TATTGTTGGA GTTTTGTTCG TTAAAATCTA AGCTT (SEQ ID NO:1).
```

FIGURE 2

MNSSCCLSSV SPMLPNLSEH PAAPPASNRS GSGFCEQVFI KPEVFLALGI VSLMENILVI
LAVVRNGNLH SPMYFFLCSL AAADMLVSLS NSLETIMIAV INSDSLTLED QFIQHMDNIF
DSMICISLVA SICNLLAIAI DRYVTIFYAL RYHSIMTVRK ALTLIGVIWV CCGICGVMFI
IYSESKMVIV CLITMFFAMV LLMGTLYIHM FLFARLHVQR IAVLPPAGVV APQQHSCMKG
AVTITILLGV FIFCWAPFFL HLVLIITCPT NPYCICYTAH FNTYLVLIMC NSVIDPLIYA
FRSLELRNTF KEILCGCNSM NLG (SEQ ID NO:2.)

FIGURE 3

ATGAGCATCC AAAAGAAGTA TCTGGAGGGA GATTTTGTCT TTCCTGTGAG CAGCAGCAGC
TTCCTACGGA CCCTGCTGGA GCCCCAGCTC GGATCAGCCC TTCTGACAGC AATGAATGCT
TCGTGCTGCC TGCCCTCTGT TCAGCCAACA CTGCCTAATG GCTCGGAGCA CCTCCAAGCC
CCTTTCTTCA GCAACCAGAG CAGCAGCGCC TTCTGTGAGC AGGTCTTCAT CAAGCCCGAG
ATTTTCCTGT CTCTGGGCAT CGTCAGTCTG CTGGAAAACA TCCTGGTTAT CCTGGCCGTG
GTCAGGAACG GCAACCTGCA CTCCCCGATG TACTTCTTTC TCTGCAGCCT GGCGGTGGCC
GACATGCTGG TAAGTGTGTC CAATGCCCTG GAGACCATCA TGATCGCCAT CGTCCACAGC
GACTACCTGA CCTTCGAGGA CCAGTTTATC CAGCACATGG ACAACATCTT CGACTCCATG
ATCTGCATCT CCCTGGTGGC CTCCATCTGC AACCTCCTGG CCATCGCCGT CGACAGGTAC
GTCACCATCT TTTACGCGCT CCGCTACCAC AGCATCATGA CCGTGAGGAA GGCCCTCACC
TTGATCGTGG CCATCTGGGT CTGCTGCGGC GTCTGTGGCG TGGTGTTCAT CGTCTACTCG
GAGAGCAAAA TGGTCATTGT GTGCCTCATC ACCATGTTCT TCGCCATGAT GCTCCTCATG
GGCACCCTCT ACGTGCACAT GTTCCTCTTT GCGCGGCTGC ACGTCAAGCG CATAGCAGCA
CTGCCACCTG CCGACGGGGT GGCCCCACAG CAACACTCAT GCATGAAGGG GGCAGTCACC
ATCACCATTC TCCTGGGCGT GTTCATCTTC TGCTGGGCCC CCTTCTTCCT CCACCTGGTC
CTCATCATCA CCTGCCCCAC CAACCCCTAC TGCATCTGCT ACACTGCCCA CTTCAACACC
TACCTGGTCC TCATCATGTG CAACTCCGTC ATCGACCCAC TCATCTACGC TTTCCGGAGC
CTGGAATTGC GCAACACCTT TAGGGAGATT CTCTGTGGCT GCAACGGCAT GAACTTGGGA (SEQ ID
NO:3)

FIGURE 4

MSIQKKYLEG DFVFPVSSSS FLRTLLEPQL GSALLTAMNA SCCLPSVQPT LPNGSEHLQA

PFFSNQSSSA FCEQVFIKPE IFLSLGIVSL LENILVILAV VRNGNLHSPM YFFLCSLAVA

DMLVSVSNAL ETIMIAIVHS DYLTFEDQFI QHMDNIFDSM ICISLVASIC NLLAIAVDRY

VTIFYALRYH SIMTVRKALT LIVAIWVCCG VCGVVFIVYS ESKMVIVCLI TMFFAMMLLM

GTLYVHMFLF ARLHVKRIAA LPPADGVAPQ QHSCMKGAVT ITILLGVFIF CWAPFFLHLV

LIITCPTNPY CICYTAHFNT YLVLIMCNSV IDPLIYAFRS LELRNTFREI LCGCNGMNLG (SEQ ID

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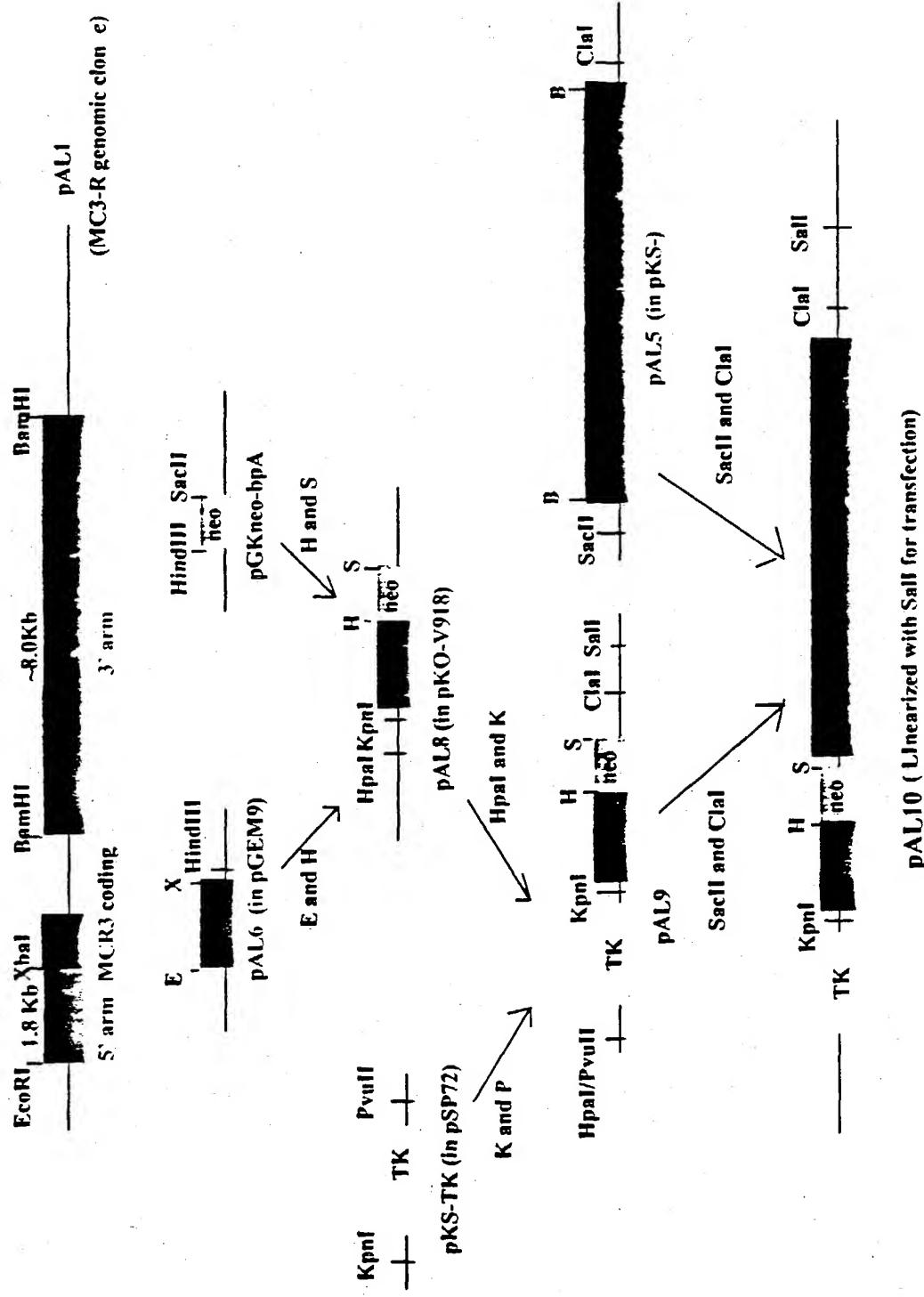
FIGURE 5
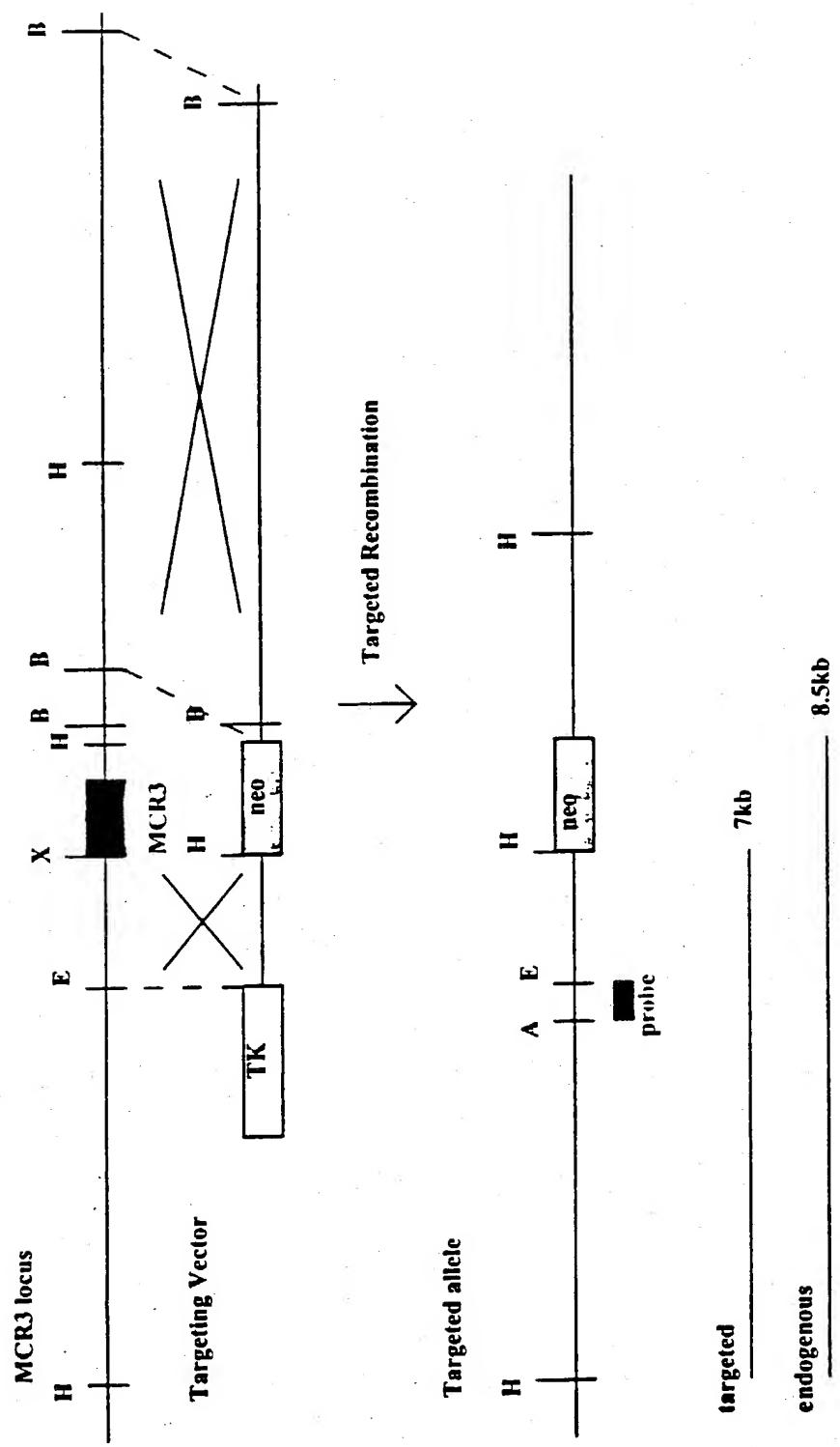
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FIGURE 6

Southern blot analysis

FIGURE 7A

KO   Het   WT

8.5 kb ➤

7 kb ➤
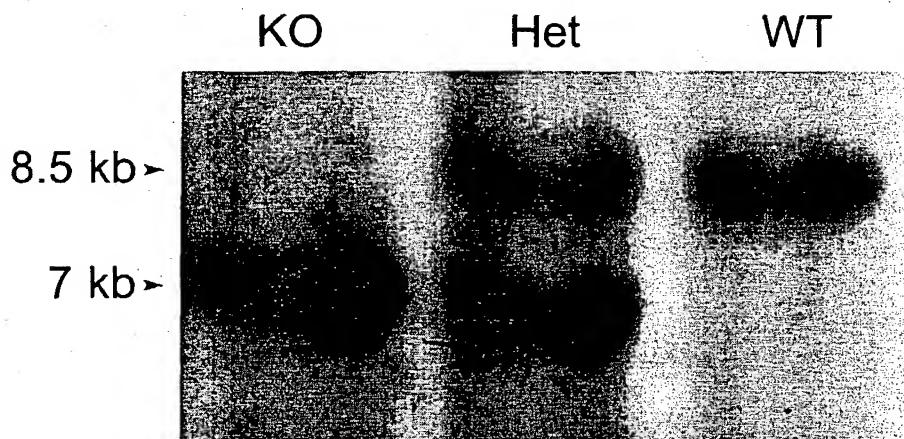
FIGURE 7B

PCR analysis

KO   Het   WT

514 bp ➤

294 bp ➤
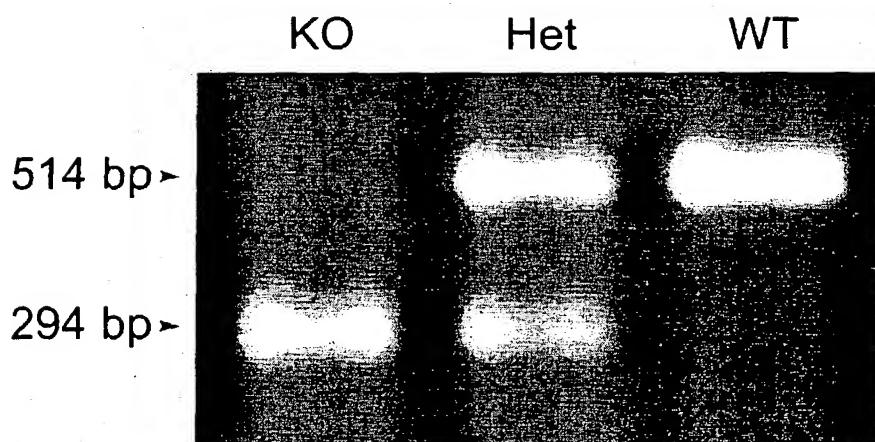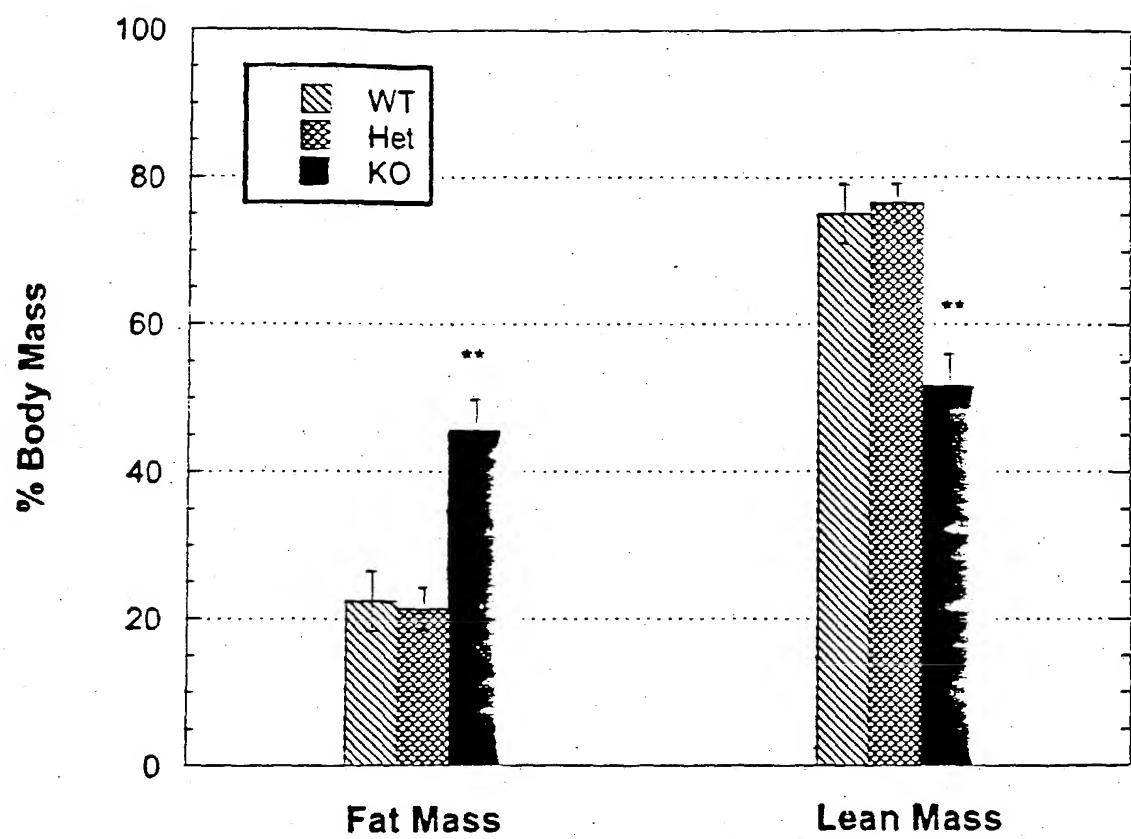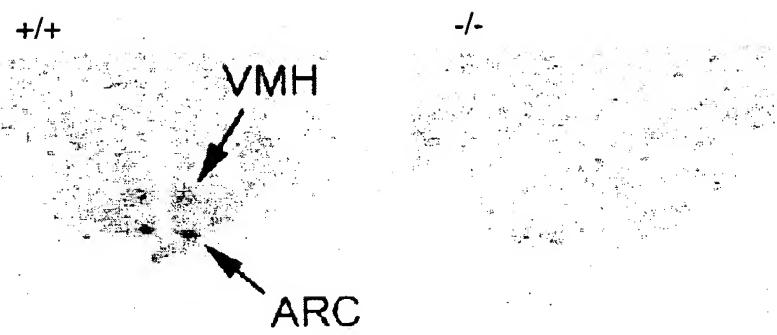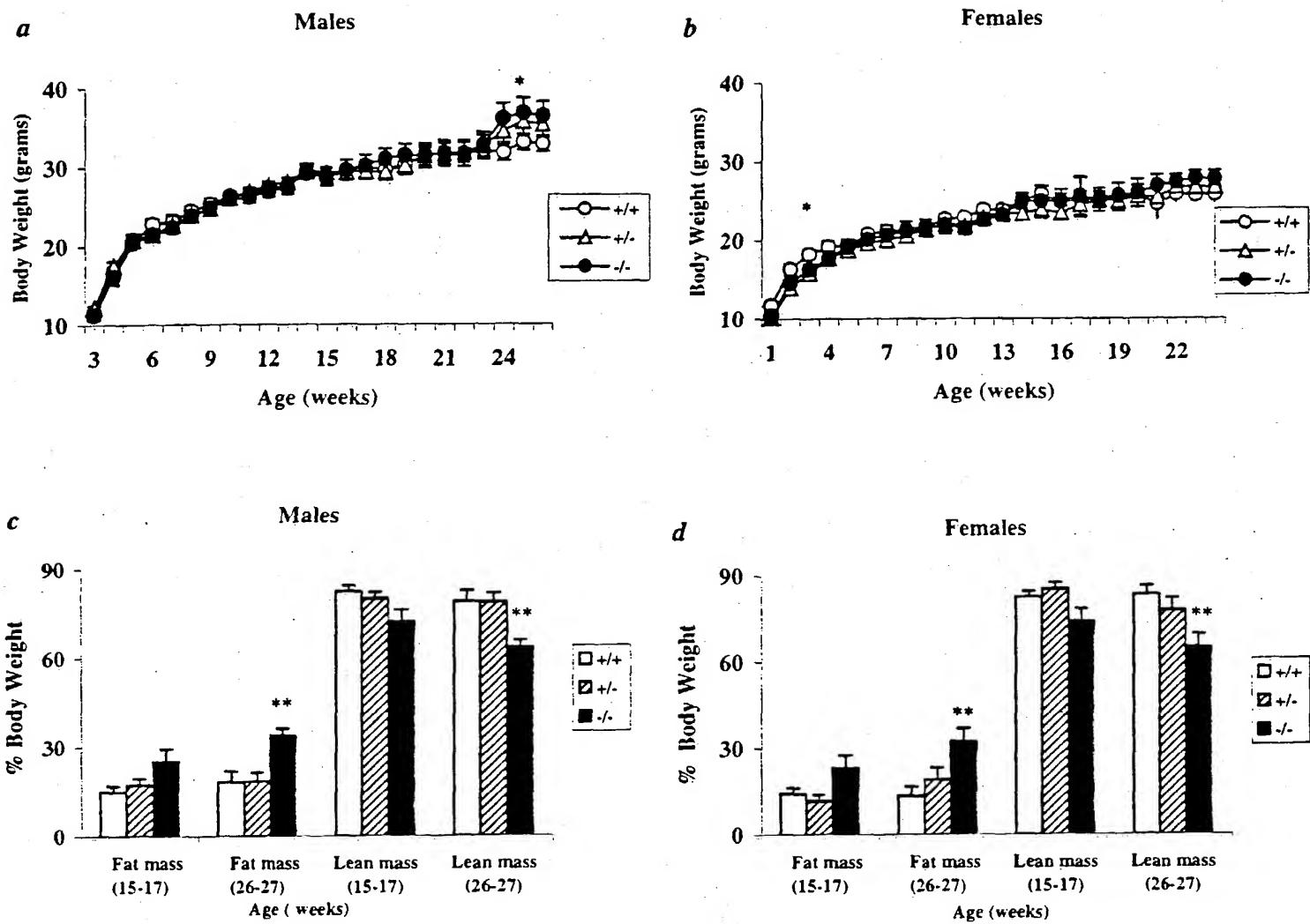
FIGURE 8

FIGURE 9
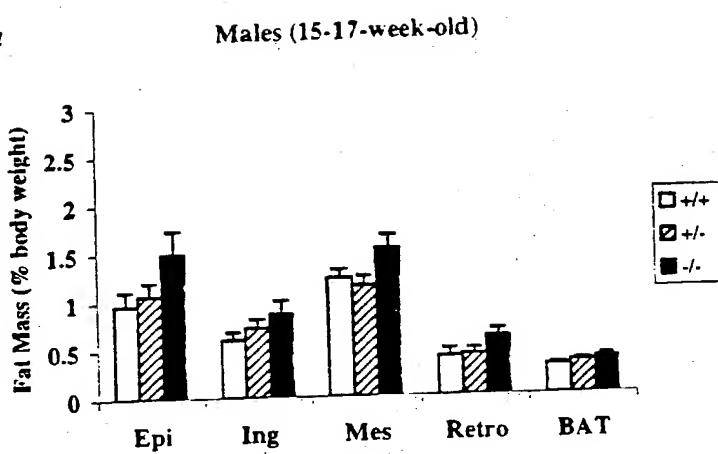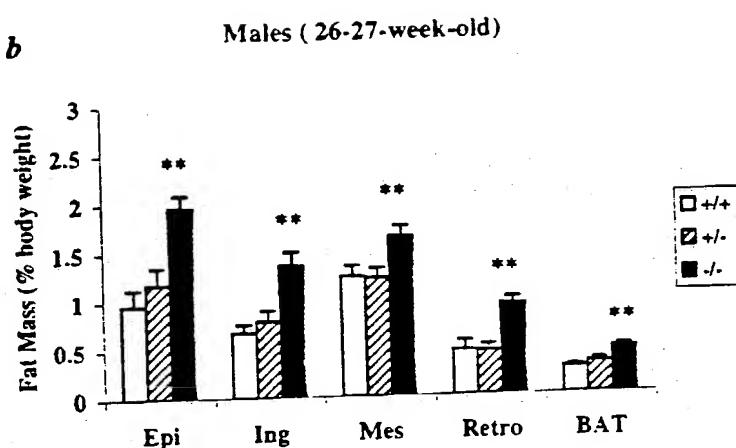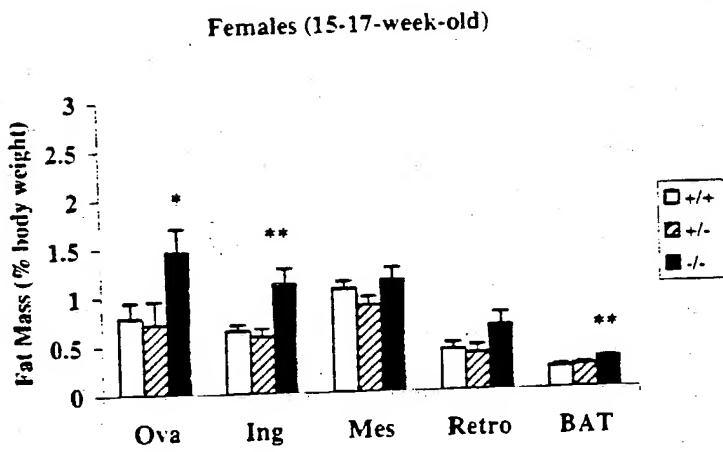
FIGURES 10A-D
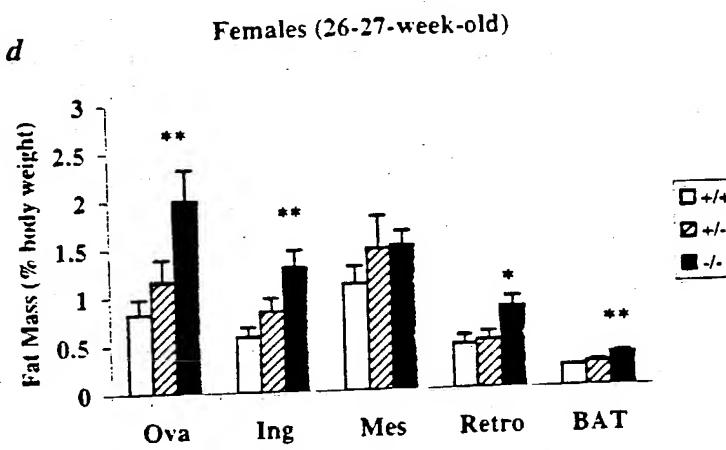
FIGURES 11A-D
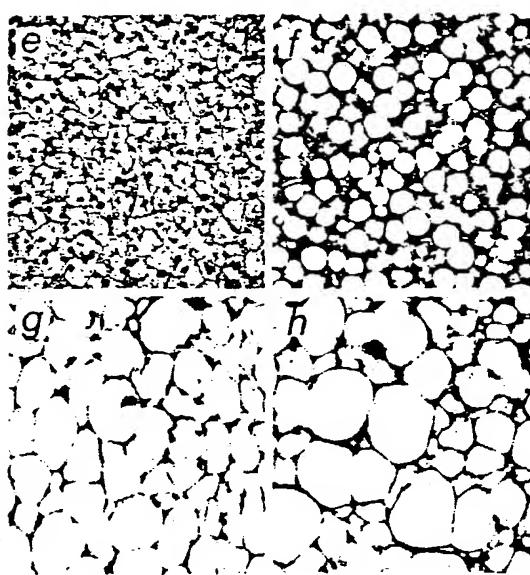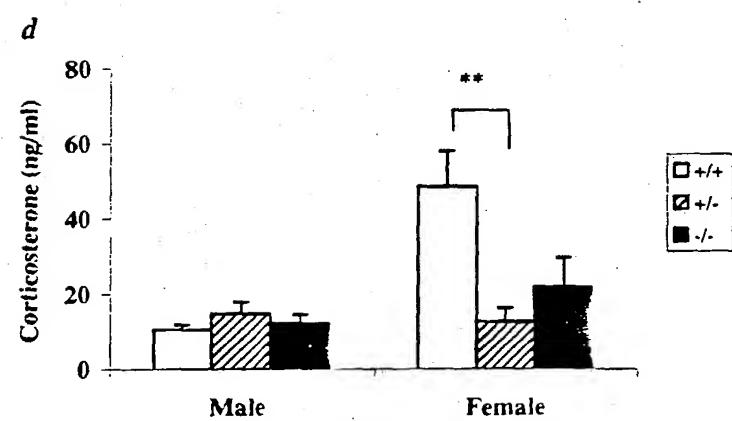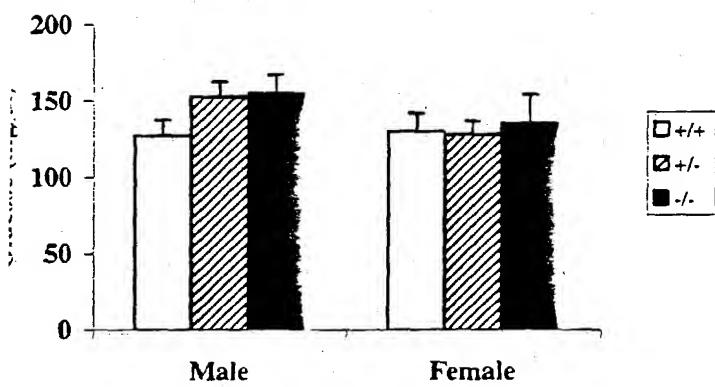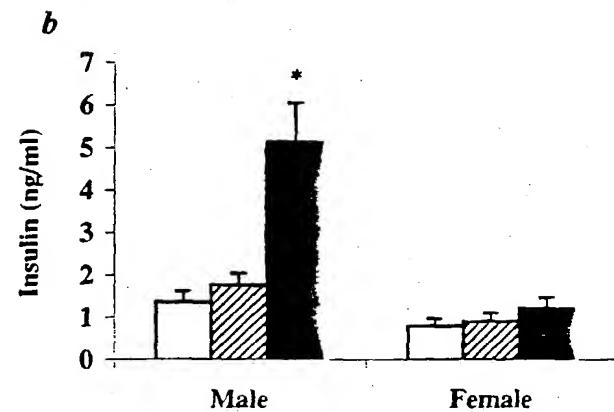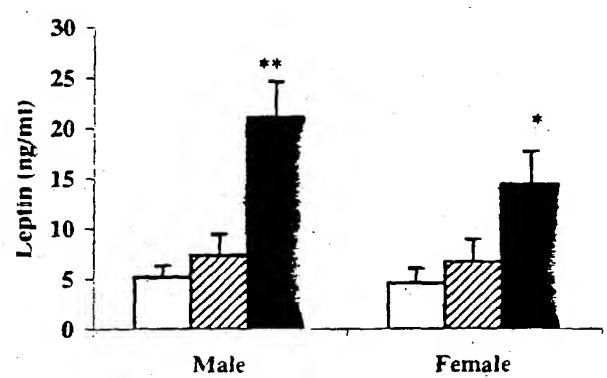
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FIGURES 11E-H

FIGURES 12A-D

a

Males on Regular Chow

b

Males on Regular Chow

c
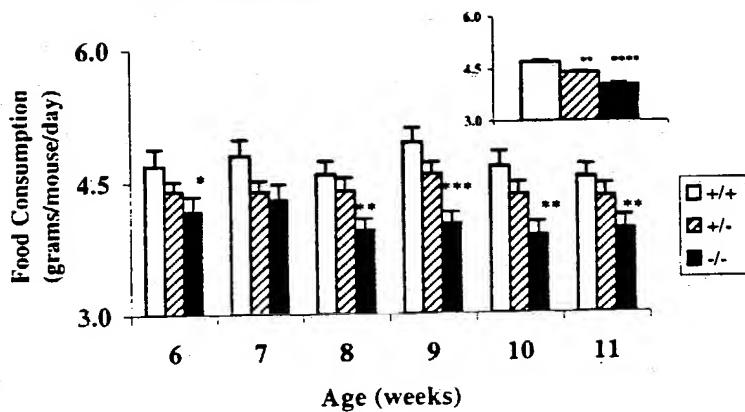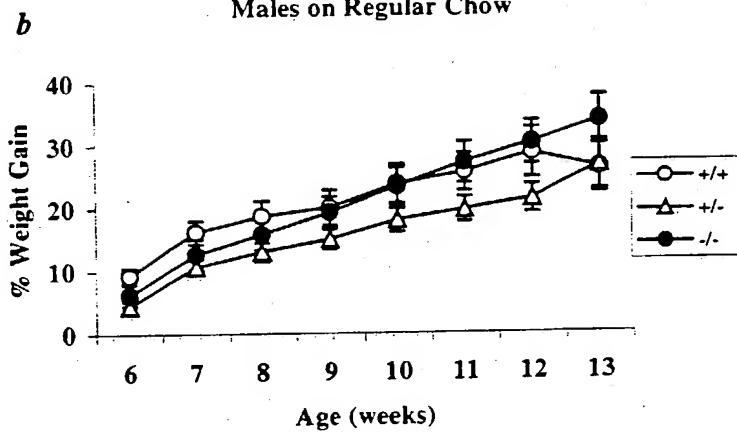
Males on Regular Chow
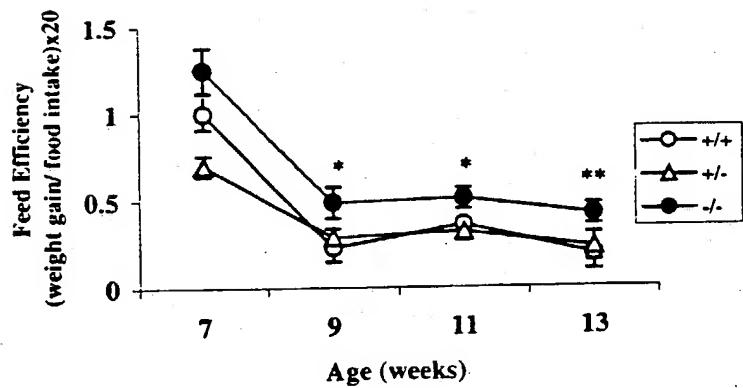
FIGURES 13A-C

d

Females on High Fat Diet
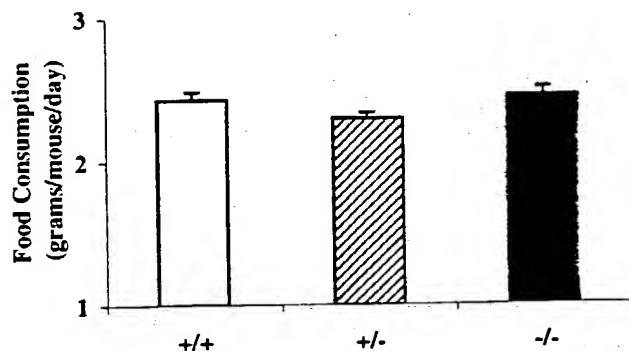
e

Females on High Fat Diet

f

Females on High Fat Diet

FIGURES 13D-F

20561Y

FIGURE 14A

b Locomotor Activity of Males

c Fine Movements of Males

d Locomotor Activity of Females

e Fine Movements of Females
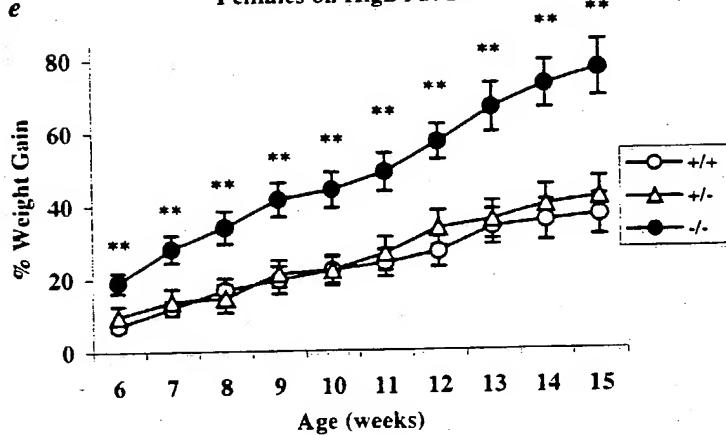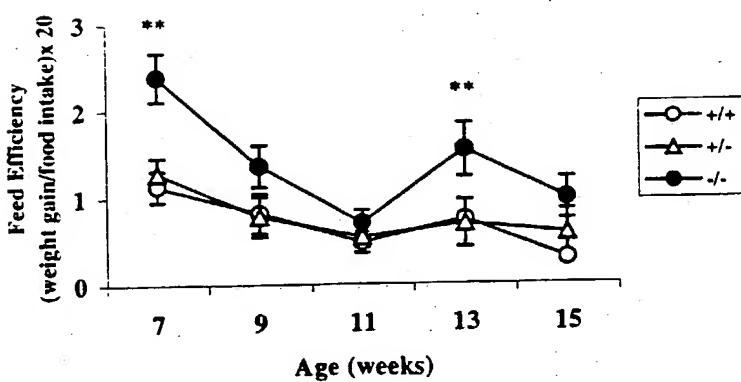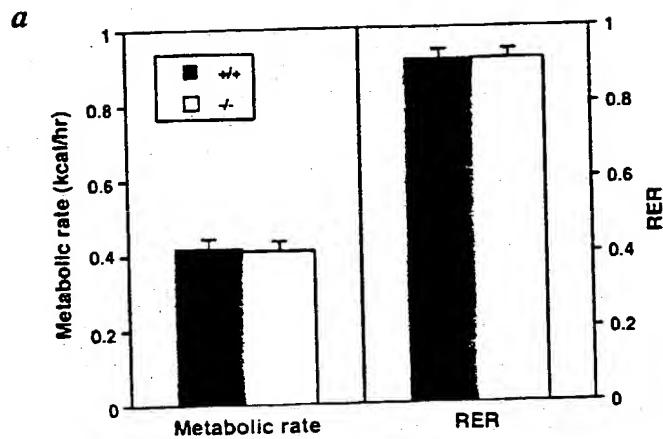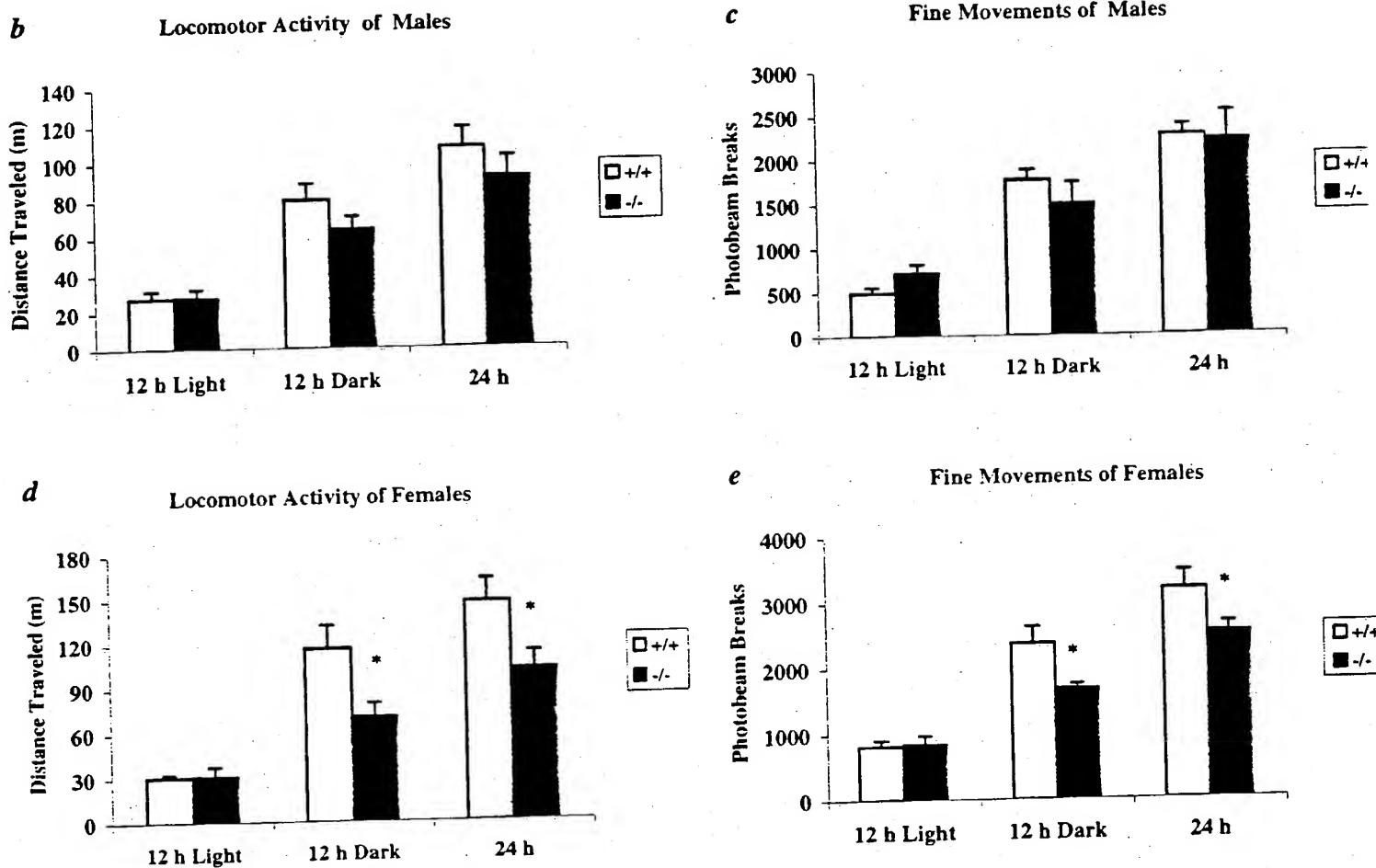
FIGURES 14B-E
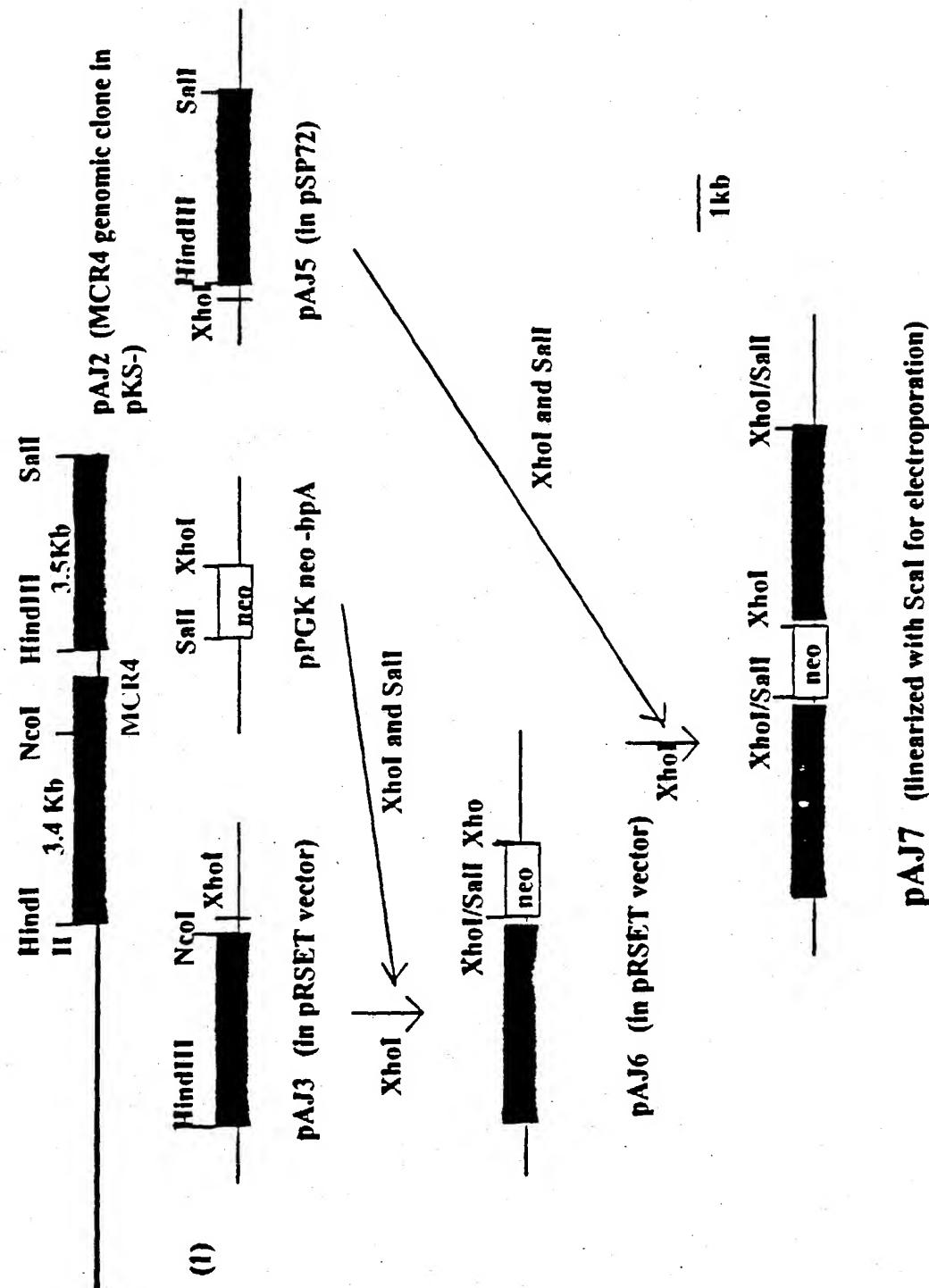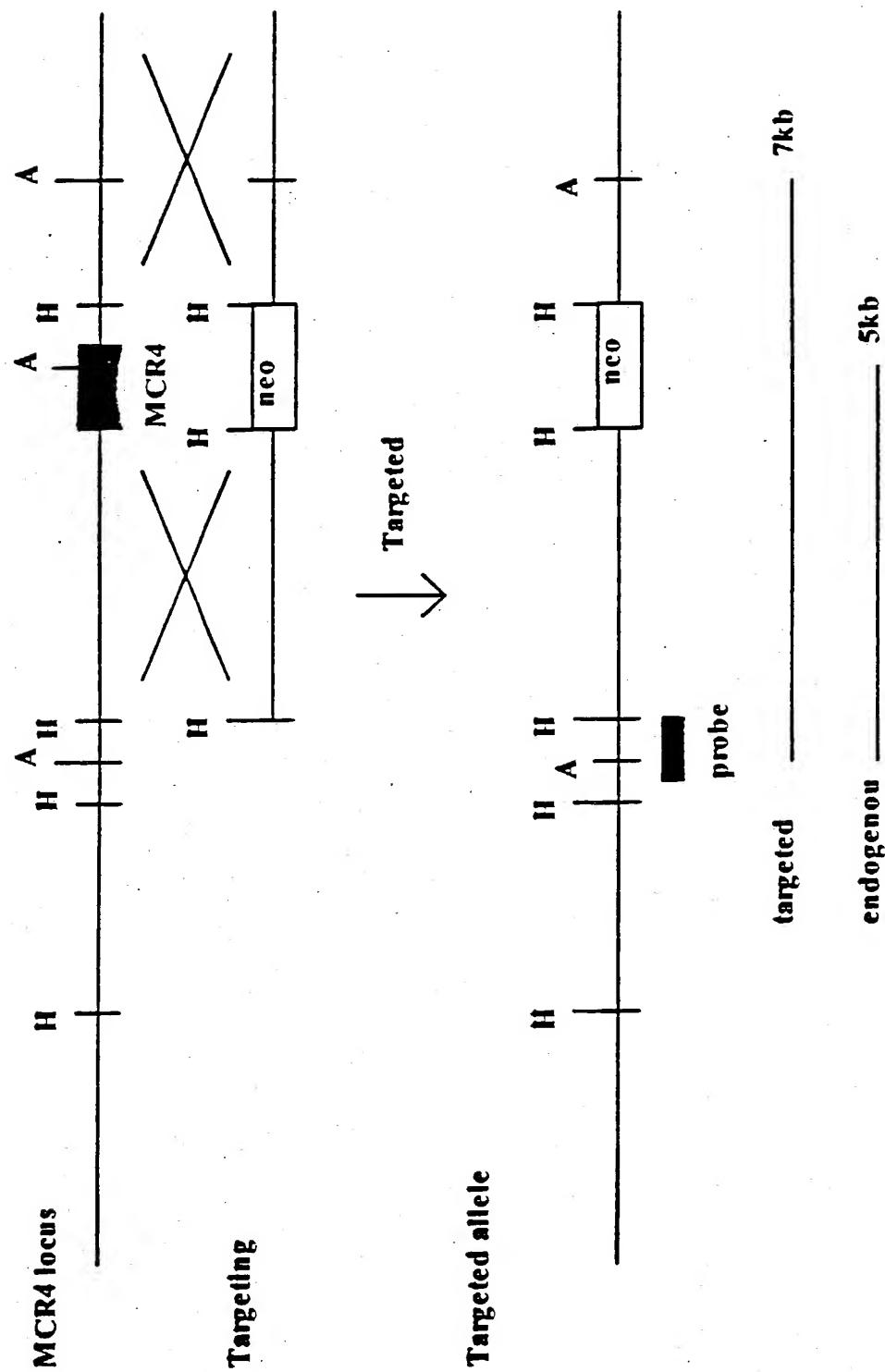
FIGURE 15

FIGURE 16

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MC3-R and MC4-R effects on body weight in female mice (age 26 weeks)

FIGURE 17

A

Females, Growth Curve

B

Males, Growth Curve

FIGURE 18A – B

A

9-month-old male mice

B

9-month-old female mice

FIGURE 19A – B

A

B

FIGURE 20A – B